

**WHAT IS CLAIMED IS:**

1. A wireless locking/unlocking device comprising:
  - vehicle side transmitter for sending a request signal to at least a predetermined zone in a vehicle compartment;
  - 5 a wireless portable unit for sending an response signal in response to the request signal;
  - vehicle side receiver for receiving the response signal;
  - position detector for detecting the position of the portable unit depending on whether or not the response signal received by the vehicle side receiver coincides with ID information stored in the vehicle;
  - 10 controller for outputting a locking signal based on a detection result of the position detector; and
  - actuator for bringing a door lock mechanism into locking state in response to the locking signal,
  - 15 the wireless locking/unlocking device, further comprising:
    - all-door closing detector which detects that all the doors are closed after a condition that at least one door is open and generates an all-door closing detecting signal, wherein the vehicle side transmitter sends the request signal in response to the all-door closing detecting signal and if it is detected that the portable unit exists within the vehicle compartment by the position detector,
    - 20 stops sending of sequent request signals, and if it is detected that the portable unit exists within the vehicle compartment by the position detector,
    - 25 the controller prohibits an output of the locking signal.

2. The wireless locking/unlocking device according to claim 1, wherein the vehicle side transmitter sends the request signal to a predetermined zone within the vehicle compartment and a predetermined zone around the vehicle alternately and repeatedly multiple times and when it is detected that the portable unit exists within the vehicle compartment, stops repeating of the sending of the request signal.

3. The wireless locking/unlocking device according to claim 1, further comprising:

10       second vehicle side transmitter for, after the position of the portable unit is detected by the position detector based on the request signal, sending the request signal to the predetermined zones within the vehicle compartment and around the vehicle; and

15       second position detector for detecting the position of the portable unit depending on whether or not the response signal in response to the request signal sent by the second vehicle side transmitter coincides with ID information inherent of the vehicle, wherein

20       the second vehicle side transmitter, if it is detected that the portable unit does not exist within the vehicle compartment by the position detector, sends the request signal to the predetermined zones within the vehicle compartment and around the vehicle intermittently and

25       the controller, if it is detected that the portable unit does not exist at least outside the vehicle by the second position detector when it is detected that the portable unit does not exist within

the vehicle compartment by the position detector, outputs the locking signal.

4. The wireless locking/unlocking device according to claim 3, wherein the second vehicle side transmitter sends the request signal to the predetermined zones within the vehicle compartment and around the vehicle alternately and repeatedly multiple times in an intermittent transmission cycle and when the second position detector detects an existence of the portable unit within the vehicle compartment, stops sending of the request signal and is shifted to a next intermittent transmission cycle and if the second position detector is incapable of detecting an existence of the portable unit in an intermittent transmission cycle, the intermittent transmission of the request signal is stopped, and

the controller, if the second position detector is incapable of detecting the existence of the portable unit in an intermittent transmission cycle, outputs the locking signal.

5. The wireless locking/unlocking device according to claim 3, wherein the second vehicle side transmitter, if the second position detector detects an existence of the portable unit within the vehicle compartment in an intermittent transmission cycle, stops sending of the request signal and

the controller, if the second position detector detects an existence of the portable unit within the vehicle compartment in an intermittent transmission cycle, prohibits output of the locking signal.

6. The wireless locking/unlocking device according to any one

of claims 1 to 5, further comprising:

door opening detector for detecting a change of state that at least one of vehicle doors is changed from its closing state to its opening state;

5        third vehicle side transmitter for sending the request signal to the predetermined zones within the vehicle compartment and around the vehicle in response to the door opening state detected by the door opening detector; and

10        third position detector which detects the position of the portable unit in response to the door opening state detected by the door opening detector depending on whether or not the response signal coincides with ID information stored in the vehicle, wherein

the vehicle side transmitter, if the third position detector detects an existence of the portable unit within the vehicle compartment and around the vehicle, sends the request signal to at least the predetermined zone within the vehicle compartment.

7. A wireless locking/unlocking device comprising:

transmitter for sending a request signal within the vehicle compartment;

20        receiver for receiving the response signal sent from a portable unit which receives the request signal; and

determining means which determines whether or not the portable unit exists within the vehicle compartment based on whether or not the response signal is detected, wherein

25        if it is determined that the portable unit exists within the vehicle compartment, sequent transmission of request signals is

prohibited.

8. A wireless locking/unlocking device comprising:

transmitter for sending a request signal;

5 receiver for receiving an response signal including an ID code  
sent from a portable unit carried by user in response to the request  
signal; and

controller for controlling the locking/unlocking of an  
opening/closing body corresponding to whether or not the ID code  
is received by the receiver, the wireless locking/unlocking device  
10 further comprising closing timing detector for detecting that the  
opening/closing body is just closed, wherein

the transmitter sends a request signal to the vehicle  
compartment in response to closing of the opening/closing body  
detected by the closing timing detector and when an response signal  
15 responding to a request signal sent within the vehicle compartment  
is received, prohibits sequent sending of the request signal to  
a predetermined zone around the vehicle.

9. The wireless locking/unlocking device according to claim  
8, wherein when a response signal responding to the request signal  
20 sent within the vehicle compartment is not received, the transmitter  
sends a request signal to a predetermined zone around the vehicle  
intermittently and the opening/closing body is locked under a  
condition that the response signal responding to the request signal  
sent to the predetermined zone is not received.

25 10. The wireless locking/unlocking device according to claim  
8, wherein the transmitter, when the response signal responding

to the request signal sent within the vehicle compartment is not received, sends the request signal to a predetermined zone around the vehicle intermittently and if the response signal responding to the request signal sent to the predetermined zone is not received,  
5 sends the request signal again to the vehicle compartment, and the opening/closing body is locked under a condition that the response signal responding to the request signal sent again within the vehicle compartment is not received.

11. The wireless locking/unlocking device according to any  
10 one of claims 8 to 10, further comprising opening timing detector for detecting that the opening/closing body is just opened, wherein the transmitter sends the request signal to predetermined zones within the vehicle compartment and around the vehicle in response to opening of the opening/closing body detected by the opening timing  
15 detector and under a condition that the response signal responding to the request signal sent to the predetermined zones within the vehicle compartment and around the vehicle is received, sends the request signal to the vehicle compartment in response to closing of the opening/closing body.

20 12. The wireless locking/unlocking device according to claim 11, wherein the opening timing detector detects a moment that any closed door of a vehicle is just opened when all the doors are closed, and the closing timing detector detects a moment that any opened door is just closed so that all the door are closed.

25 13. The wireless locking/unlocking device according to any one of claims 8 to 10, wherein the transmitter prohibits sending

of the request signal in response to an operation signal of a switch disposed within the vehicle compartment.

14. The wireless locking/unlocking device according to any one of claims 8 to 10, further comprising locking/unlocking detector  
5 for detecting the locking state and unlocking state of the opening/closing body, wherein the transmitter prohibits sending of the request signal corresponding to a detection of a locking state.

15. The wireless locking/unlocking device according to any  
10 one of claims 8 to 10, further comprising a timer which starts time counting in response to the detected closing timing of the opening/closing body, wherein the transmitter prohibits sending of the request signal when the timer counts a predetermined time.